GENERAL ARTICLE

Act of Fiction

Simultaneously Experienced Multiple Perspectives of (Un)reality When Engaging with Narrative-Based Art

EINAT AMIR, JOSHUA SOFAER, AND **MIKKO SAMS**

ABSTRACT

The authors propose a new conception of the mechanism that occurs during a narrative-based art experience—the "Act of Fiction." They claim that there is no "suspension of disbelief" but rather something more similar to our decision-making systems, enabling us to simultaneously be present in the real and the unreal (fictional). The article's first part contains a narrative account in which an Act of Fiction takes place; it exemplifies what it also describes. The second part provides an analysis of this phenomenon through a review of current literature and our position on it. The third part proposes an outline for a primary examination of what might be happening in the brain in the experience of an Act of Fiction. The authors conclude by suggesting directions for future research.

This article outlines a unique cultural phenomenon: the simultaneous experience of different perspectives: that of the reality of the world around us and that of the perceived *un*-reality (or "fiction") presented to us during our encounter with narrative-based art, such as theater, opera, film, and literature. We offer the term Act of Fiction to describe this unique experience, of holding together multiple realities simultaneously, in disbelief and belief.

The article is divided into three distinct parts. In the first part, A Night at the Opera, we imagine (and consequently ask the reader to imagine) a set of circumstances in which an Act of Fiction takes place. This is neither memoir nor presentation of empirical evidence; rather it is a creative compound derived from our discussions of the phenomenon in question. This part is intended to transport the reader, with poetic license, into the world of a narrative encounter as an audience member of the opera *Madame Butterfly* while simultaneously identifying the limits of that transportation. This initial section, then, exemplifies the Act of Fiction while describing it. We might have chosen any number of instances to describe this temporal phenomenon, from film, dance, or literature, and the substantive point would remain.

In the next part, Act of Fiction, we turn to the existing literature in relevant fields, namely social psychology, cognitive neuroscience, and cognitive narratology, seeking existing research related to the Act of Fiction. The closest existing theorized phenomenon is Narrative Transportation [1]. However, transportation into a narrative is largely presented as a single scale, ranging from low to high, leaving out the level of engagement in reality. Our point is to emphasize the simultaneity of experience, in reality and in fiction, at once and at the same time. We explore the existing transportation literature to ascertain the significance and different benefits of narrative engagement and hypothesize about what could be achieved with further research on the Act of Fiction.

The third part, Brain activity in Reality Versus Fiction: Experiments, proposes a first step in the examination of what might be happening in the brain during an Act of Fiction. So far, there is little scientific information that can indicate the difference in brain activity when processing a fictional narrative versus when processing a real-life situation. Gaining such knowledge could be an important step in understanding the ways in which the brain processes fiction and art. (In the supplemental appendix, we offer a tentative experimental model. We do so more to stimulate discussion than to produce data, as the model we propose, while practicable, also demonstrates the limits of current brain science methods.)

Part 1 is poetic, Part 2 is systematic, and Part 3 is speculative. We offer these different approaches collectively, as writers of this paper coming together from the arts and sciences. We present our proposition as a kind of thought experiment for consideration and debate. We hope that this paper will contribute to the research of ways and directions for understanding and enhancing the human experience when engaging with narrative-based art [2]. We believe that this

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multidisciplinary attempt best reflects the approach of our transdisciplinary team, as we believe that the complexity of mind/narrative relationship can only be realized through collaborations between researchers from different fields [3].

A NIGHT AT THE OPERA

We are sitting in the stalls. I have had one glass of wine: enough to loosen up but not so much as to obliterate. While excited, I am also nervous: nervous that I should enjoy the production, that it will be worth the money, and mostly, that they will enjoy it. I also confess, despite having been to the opera many times, to still feeling a kind of not belonging. At the same time, I perform naturalness, as a member of the opera-going public, which is accompanied by an acknowledgment of privilege, or middle-class guilt. It is all such an unnecessary burden to bring to any art form, and perhaps especially one that has the capacity to cut through social construction and appeal directly to an emotional core.

And so it is that we peruse the program, familiarize ourselves with the plot, and settle into our seats. The heavy, deep-red velvet and neoclassical design of the vast auditorium, with its gold-embellished cartouche, lion-drawn chariots, and pilastered boxes, is somehow simultaneously exquisite and vulgar. This is an architecture of contradictions. The lights dim. Polite applause as the conductor enters. There is a faint mechanical sound and then a whoosh as the curtain rises. Anticipation.

This opera is a minefield of aesthetic and cultural problems, both within the internal world and in the way that Japan, and specifically Japanese women, are exoticized and caricatured. The opera highlights the violence of imperialism but also replicates it. There is nothing Japanese about the plinkety-plonk of sections of the musical treatment; it simply enacts an othering.

And, of course, there are the familiar startling issues in opera, for example, the fact that the characters are singing in Italian, or rather that they are singing at all. Sitting next to my Asian partner, our hands gently touching, I am suddenly embarrassed, wondering what my companion thinks about this fantasy unfolding on stage. Then, as Suzuki folds the wedding kimono carefully into a neat rectangle, I am reminded that I will have to do the laundry when I get home. The cumulation of these problems (from laundry to racism) seems to distance the possibility of narrative transportation.

And yet . . .

There is no escape from the brutality of Madame Butterfly's mistreatment, from the power of her belief in her love, and for all of us who have been abandoned and heartbroken it is hard resisting the emotional pull and identification with her tragedy. Despite all the problems, I am engulfed by my visceral response. I am left weeping as Madame Butterfly blindfolds her son so that he does not see her suicide, and I am overpowered by the tragic beauty of her song.

The impact of all the artifice on the audience, by some strange paradox, is one of gut instinct. The red velvet, the gold embellishments, the conductor's baton, the performers' years of training: All activate something primal in the audience. I am distraught at the pain inflicted on a fictional woman, while I am also pursuing a critique, concerned for my lover, and managing my chores—occupying several realities at once and all in the knowledge of the others.

There are always multiple perspectives to our surroundings in the brain activity. What, if anything, is the difference when experiencing art?

Sitting in the auditorium, I do not think that the woman in front of me has really plunged a knife into her heart. And yet I mourn for her. At best, this mourning is an emotional release, a purification of repressed fears—catharsis—that not only makes life more bearable but can fill it with joy. The ability to access that place of catharsis is not simply a question of the artistry on stage. Perhaps, despite all the effort that goes into the production, the greater onus is, in fact, on the audience.

I bring my emotional baggage with me into the auditorium, and I dump it at the foot of the stage. "Deal with this," I demand. The production comes to meet it. Sometimes the distractions outweigh the artifice, and sometimes I am fully transported into the fictional world.

Why is the response so variable? What, if anything, can we do to enhance this state of being?

ACT OF FICTION

In folk psychology, the Self is regarded as a coherent singular system that reflects our individual personality. However, it is today accepted to think of the Self as multiple decision-making systems that constantly have different and even conflicting needs, which often work simultaneously for different purposes [4]. Internal conflicts such as those we might experience at the opera reflect simultaneous activities of those systems. These mechanisms together form our multi-voiced Self.

Folk psychology also suggests that the Self has specific characteristics and that knowing them makes it possible to predict a person's actions in any given situation. This may be true, but only in an abstract sense. What the Self does strongly depend on is the context in which it operates and on our emotional state. One example of a context that can affect the Self and its various systems in a way that is different from our other daily experiences is engaging with narrative-based art.

When we choose to engage with narrative-based art, we are transported into a fictional world. We understand and accept the behaviors of protagonists who, for example, fight dragons and fly in the sky in a very different reality from our own. There are individual differences in the degree of transportation [5], but any level of experiencing it can be meaningful [6].

What are the cognitive processes that allow us to be transported into a fictive narrative? Do we need to "put to sleep" some mind activities to be able to identify with Madame Butterfly as she grieves for her lost love? The English poet Samuel Taylor Coleridge (1772–1834) proposed that "the willing suspension of disbelief" [7] describes what happens when we are transported into a fictional narrative. He suggested that there is a special mechanism for disbelieving events that are not occurring in reality, and that this mechanism is deliberately suspended when we are transported to a fictional world.

However, we argue that Suspension of Disbelief is an inaccurate description of this process. In a similar manner to the

ways in which our decision-making systems work in everyday life, we are also able to be present simultaneously in real and in fictional worlds. There are two different mechanisms (level of transportation and reality monitoring [8]) that slip in and out of our attention, depending on several factors, including autobiographic memory and presentational context. The psychological and underlying neural mechanisms that we use for processing fiction are largely the same ones used for processing real-life events and social interactions. Therefore, the separation between what is based in reality (having an external source) and what is not (being possibly represented by an external source but happening internally) is a continual challenge for our brain, and neither is "suspended" [9].

We suggest a more appropriate term than Suspension of Disbelief to describe what happens during transportation into an artwork. Based on our discussions, we offer the term Act of Fiction. We turn to social psychology, cognitive neuroscience, and cognitive narratology for a better understanding of the Act of Fiction. One important aspect of the Act of Fiction is narrative transportation. However, it is largely presented as a single scale, ranging from low to high transportation into a narrative, leaving out the reality-monitoring aspect. We still find the existing transportation literature significant to the understanding of the different benefits of the Act of Fiction and to the hypothesizing process of what could be achieved with further research.

So far, transportation has been mainly researched using literary texts. Social psychologists [10] have defined narrative transportation as the act of becoming cognitively, emotionally, and imaginatively immersed in a narrative. It may occur while reading any kind of text, but transportation is stronger when the narrative is of "higher quality" [11].

Based on recent research regarding narratives that are listened to or watched [12], we argue that: (1) Transportation is a cognitive process that can occur while interacting with any narrative-based art, and (2) transportation is based on the same mental, psychological, and neural mechanisms that are used in interacting with everyday reality.

A multitude of factors affect the level of transportation into an artwork. One of them is our current state of mind. Remembering that we need to do the laundry, for example, can make transportation to a fictional world more difficult. Reading a boring science article may raise our motivation to be transported and lead us to the stalls of an opera house.

Another potential enhancement of transportation could similarly manifest due to the juxtaposition of the reader's emotional state and the narrative's emotional tone. An important factor can be having preexisting low-arousal positive emotions such as being in a contented, thoughtful state. Holding beliefs that match the narrative's values and morals could increase identification with the protagonists, thus enhancing transportation [13].

Recent research [14] has also found that pre-framing a narrative in a "theater condition" (telling participants the text they are about to read is part of a play) led to a higher state of transportation compared with other examined reading conditions. Additionally, an fMRI experiment [15] found that the vividness of imagery (for example: "the heavy deep red velvet . . . with its gold-embellished cartouche") activates the participants' "core" network (a set of brain regions in charge of cognitively building and keeping a complex and coherent scene) especially strongly [16]. It was also found that individuals who are more motivated to approach emotion-inducing situations in a positive manner (such as opera enthusiasts) have a higher probability of experiencing transportation [17].

In an experiment that involved viewing an opera, participants were assigned to one of two conditions: one with a high empathy focus ("imagine vividly how a performer feels . . . and try to feel those emotions") and the other with an objective focus ("consider the musical descriptions and ignore intuited performer feelings") [18]. Participants conditioned to high empathy reported more nostalgic feelings while viewing a sad aria than those conditioned to objectivity. Participants conditioned to high empathy also reported feeling powerful and had increased respiration rate while viewing a happy aria, in comparison to the objective condition group.

What we can learn from these experiments is that the level of transportation into a fictional world is dependent on one's emotional state and can be enhanced or decreased by the experience's framing. We argue that the awareness of what is real and what is fiction is never suspended—reality's mechanisms seep into narrative art, and emotions and thought manifested in fiction seep back into reality.

The constant awareness that an experience is "unreal" is what allows us to be transported into the narrative by providing us with a sense of safety. Narrative-based art has a special role in our mental processes. It provides us with models and simulations of our social selves and a safe, yet deep and immersive, platform for practicing interpersonal interactions. We suggest that the opportunity to have a safe environment for emotional practice of social events is an important aspect of the Act of Fiction. Being transported into a narrative allows us to emotionally experience negative consequences of our behaviors, or failures, without dealing with the results of such behaviors, as we would be required to do in reality. This is one of the special features of the Act of Fiction that is different from the other goal-oriented systems that are part of the Self. We can experience genuine fear when Madame Butterfly grabs a knife to stab herself, for example. These emotions feel real to us, as we are responding to a simulation of reality with the same brain processes that we would have if these events were part of reality [19], but they are also somewhat changed by our sense of safety. This is the Act of Fiction—a unique cognitive process.

When we transport into fiction, we engage with a simplification and compression of social information. It assists us in better understanding different forms of human interactions and prepares us for "real life" [20]. It can also make us more compassionate and improve our empathic responses toward people from groups other than our own [21]. It may also increase the feeling of belonging (which many of us in these times are lacking) and increase satisfaction with life [22].

We wish to emphasize that the experience of going to the opera is more than the experience of the opera. If the story is good enough and the audience member is in the right emotional and cognitive space, they may be transported into the creation and undergo an Act of Fiction that will form a cogni-

tive simulation of their social world and help them cope better with their own reality. Yet even when we think the story and its delivery are great, this does not necessarily happen. We hope that, with advancements in cognitive neuroscience, we will be able to know more about the neural processes that activate the Act of Fiction, so we might understand more about what makes a work of fiction "work" for us.

BRAIN ACTIVITY IN REALITY VERSUS FICTION: EXPERIMENTS

So far, there is insufficient experimental evidence for possible separate "neural signatures" for brain processing of fictional narratives versus processing of real-life situations. Normally, we are aware of the difference between fiction and reality. However, even when we know that a narrative is fictional, we can still feel strong emotions while experiencing it. We use past knowledge stored in our memory to understand what is happening in the story, and while doing so, we also somehow simulate the events of the story in our brains. This suggests that there are similarities in the way our brain perceives reality and fiction and that they are probably based on the same cognitive and neural mechanisms. Neural processing of reality and fiction, therefore, could look very similar in brain scanning. How then could we trace the differences in brain activity during reality versus fiction?

In addition to offering the novel concept of the Act of Fiction, we add a neuroscience experiment outline that could serve as a starting point for research on this concept. However, it would still be too basic and abstract to provide us with insights into the unique experience of simultaneously operating in multiple worlds. Therefore, we decided not to pursue it, for the moment. We are posting the experiment outline as a supplemental online appendix to this article, in the hope that it would be of help, or inspiration, to others.

Our outline for brain experiments aims to respond to these research questions: *Can we decode from brain activity when people are perceiving a story as fact versus fiction? What are the main neural structures, or their connectivity patterns, underlying the decoding? What do we know of the functions of these brain areas based on previous research?*

Answering these questions requires several well-controlled replicated experiments. For the sake of making these experiments we would need to assume that there is a commonly agreed-on reality, existing independently of an observer. We would also assume that there is commonly agreed-on fiction, such as the opera *Madame Butterfly*.

The experimental setup is based on previous research [23]. Subjects undergoing functional Magnetic Resonance Imaging (fMRI) perceive the same stimulus framed in two different ways. The stimulus is a self-made (bespoke as opposed to found) audio story about love, abandonment, and eventual suicide. It is presented in two conditions: In the Documentary condition, the experimenter frames the narrative as describing real events; in the Drama condition, the experimenter frames the same narrative as purely fictional and based on the story of the opera *Madame Butterfly* (see a more detailed outline in the supplemental appendix).

We hypothesize that this experiment could result in finding different brain activations in the two conditions and therefore contribute to the decoding of fact-versus-fiction activity in the brain. This hypothesis is partially based on research done with psychotic patients while they were immersed in unreal scenarios [24].

(NOT) A CONCLUSION

For this set of authors, the incentive for writing was to meet at a point of shared concern and to try to understand, from our diverse disciplinary perspectives, more about the Act of Fiction—a phenomenon that we have all separately experienced.

We turned to social psychology, cognitive neuroscience, and cognitive narratology for a better understanding of the Act of Fiction. We suggest that one of the important aspects of the Act of Fiction is that it provides us with a safe environment for emotional practice without real life's social consequences. This is how the Act of Fiction differs from our other goal-oriented systems.

If to experience an Act of Fiction means to be in both reality and fiction at the same time, we fantasized about experimenting with ways to quieten reality and deepen transportation. Could we create a "magic pill," or instructions, that could be given to anyone wanting to enhance their transportation level into a work of art?

As part of our research, we came up with an experiment of Decoding Reality versus Fiction from brain activity. The resulting data could promote the understanding of the differential brain activation in states of reality and fiction, but it would still be too rudimentary to provide us with insights into the experience of simultaneously operating in multiple realities—of sitting in the opera house with our emotional baggage, our critique, our laundry, our lover, our response to the power of the song.

We anticipate that soon, perhaps with the advancement of VR technologies in the use of cognitive neuroscience and social sciences, we can understand much more. But we also anticipate that there is a long way to go.

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<1>Appendix

Brain Activity During Reality versus Fiction: Experiments

Is there a specific signature of brain activity that could reveal if one is experiencing something that is not reality but fiction? This is perhaps a rather basic question, a first step in trying to understand what is happening in the brain during an Act of Fiction. Normally we are well aware of the difference between the two (we can usually answer very easily if the woman we saw actually plunged a knife into her stomach or if it was a stage effect). We can feel strong emotions when we experience fictional narratives, aware that what is happening is not reality. This suggests that there are similarities in perceiving reality and fiction that are probably based on the same cognitive and neural mechanisms (including our emotions). We use the past knowledge stored in our memory to understand what is happening in the story and when doing so we also somehow simulate the events of the story in our brains. Perception of fiction shares many similarities with perceiving reality, but are there differences?

For the sake of this experiment, we do not confuse the reasoning by discussing important questions like social construction of reality, the nature of reality, social grounding of reality, the effect of background culture, or other phenomena which may strongly affect how we perceive and understand reality and fiction. This would complicate our task too much, but we are very aware of the importance of these questions. For now, we simply assume that there is a commonly agreed reality, existing independently of an outside observer. We also assume that there is commonly agreed fiction, such as the opera *Madame Butterfly*.

A mechanism in our brain somehow informs us that what we experience is either reality or fiction. This mechanism works efficiently; we usually have no problems in realizing the difference. However, the mechanism can also be discombobulated, for example, in daily life upon waking up, or, more crucially, in severe mental conditions such as psychosis. What we now know of the underlying neural basis of the latter may provide us with some clues as to how this mechanism operates.

How can we probe this mechanism? It may be embedded in many other operations and events in the brain that are very difficult to isolate. (For example: In reality, our bodies might be in motion,

while in the opera house we might sit still in the dark. In reality, we may step up to intervene; in the opera we remain in the safety of our seats.) One methodological issue in experimental research is that the experiment should keep all other things constant except the one thing we want to characterize, in this case the mechanisms making a difference between reality and fiction. Direct comparison of brain activity when operating in reality (for example, being a guest at a wedding) and operating in fiction (witnessing the representation of a wedding on a stage), would be possible in principle, but there are many possible confounds that could explain differences in brain activity but are unrelated to making the distinction between reality and fiction.

On the other hand, observing events around us without our own direct participation is what we do every day. We view things and people very much as we view a play, or a film, or an opera, and make interpretations of what is happening. We also listen to others telling us stories of their own past events. Our experiment assumes that this is why listening to a story or viewing a film during a brain measurement is a valid imitation of our normal behavior. This is a core assumption in what is called naturalistic neuroscience [1].

We suggest below an experiment where subjects, during functional Magnetic Resonance Imaging (fMRI), perceive exactly the same stimulus, which is framed as being either fact-based documentary, or conversely as invented fiction. The experimental setup is based on previous research [2].

Research questions: Can we decode from brain activity when people are perceiving the story as fact versus fiction? What are the main brain structures, or their connections, underlying the decoding? What do we know of these brain areas based on previous research?

The concepts of reality and fiction are very abstract, defined in different ways depending on our background and field of research. Therefore, it is important to operationalize what we mean by these concepts in the present experiment. Our operationalization is the following: *The subjects listen to a story. The subjects are instructed to believe that the story tells of events that have really happened (reality), or conversely, that it is entirely fictional. The events described in the story could happen in everyday life.*

Stimulus and Subject

The stimulus is a self-made audio story. It tells about love, abandonment, and eventual suicide. The duration of the narrative is 15 minutes. The stimulus is presented in two conditions: In the Documentary condition, the experimenter frames the narrative as describing real events; in the Drama condition, the experimenter frames the same narrative as purely fictional and based on the story of the opera *Madame Butterfly*.

All subjects (40) participate in both the Documentary and Drama conditions. The conditions are separated by at least 6 months to diminish the influence of learning on the results. The order of the conditions is counterbalanced, so that half of the subjects first receive the Documentary condition and the other half the Drama condition. It is important that the same subjects participate in both conditions, because many aspects of the neural processing of the story are subject-specific, e.g. depending on their life histories.

Analysis of Data

We use the inter-subject correlation (ISC) method in data analysis, where we calculate voxel-wise temporal correlations of activity between every pair of subjects across small brain areas (2 mm^3) across the brain during the stimulus [3]. Instruction-dependent differences in ISCs at different brain areas then suggest differential processing of the stories in the two conditions.

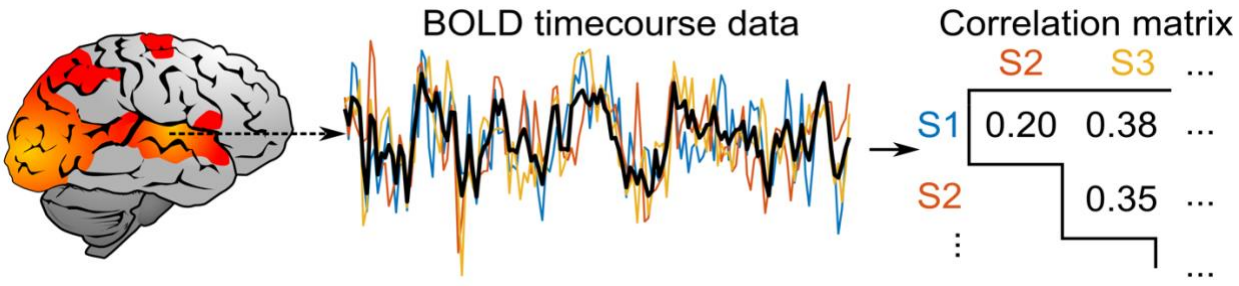

Figure 1. Principle of ISC. When listening to the same story or a piece of music, participants experience it in a similar way. Temporal-cortical brain activity (blood-oxygen-level-dependent BOLD signal) of three participants, listening to music, is depicted with thin colored lines; continuous thick line shows the mean activity across the subjects. Correlation of signals measured from different locations is then calculated between participant pairs, as is also the mean correlation across the participants. The locations where the mean correlation is statistically significant are then color-coded and mapped on the brain.

Expected Results

Our general main hypothesis is that we find different brain activations in the two conditions. Studies of subjects who have had one psychotic episode shed some light on brain activations while the subject is immersed in unreal scenarios. We expect that the areas showing differential activation in our Reality versus Fiction experiment will be found in similar brain areas to the ones found in such research [4]. It has been suggested that in psychosis the function of the brain's salience mechanisms is compromised. Salience refers to the mechanisms attaching significance or meaning to events. The salience network primarily consists of Anterior Insula and dorsal Anterior Cingulate Cortex [5]. However, we also expect to discover other differences specific to the story used as a stimulus.

References and Notes

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